



# **Final Supplemental Environmental Impact Statement For Freshwater Aquatic Plant Management**

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## **The Water Quality Program**



**February 2001  
Publication Number 00-10-040**



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**Final Supplemental  
Environmental Impact Statement  
For Freshwater  
Aquatic Plant Management**

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**The Water Quality Program**

February 2001  
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Prepared by:  
Washington State Department of Ecology  
Water Quality Program

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# Fact Sheet

Project Title:	State of Washington Aquatic Plant Management Program								
Proposed Action:	The Proposed Action is a Supplement to the Department of Ecology's 1980 Environmental Impact Statement for aquatic plant management, which addressed the application of aquatic herbicides to freshwater. The action is a non-project proposal under State Environmental Policy Act (SEPA) rules and the Environmental Impact Statement (EIS) will be integrated with on-going agency permitting procedures for aquatic herbicides. The recommended alternative is an integrated aquatic plant management approach using the most effective and environmentally protective mix of vegetation control methods that may include biological, manual, mechanical and chemical methods. Other alternatives analyzed include chemical use only, mechanical use only, biological use only, and no action, which is the continuation of current policy.								
Lead Agency:	Washington State Department of Ecology								
Responsible Official:	Megan White, Water Quality Program Manager								
Contact Person:	Kathleen Emmett, Water Quality Program								
Licenses, Permits:	<p>This list reflects permits required for various plant management alternatives discussed in this document, including use of aquatic herbicides, rotoation, dredging, manual and biological control methods. Not all permits listed below are required for all activities discussed in this document. Requirements may change; please check with resource agencies to determine permits requirements for a particular project. An overview of state programs for aquatic pesticide regulation is provided in Section I.</p> <table><tr><td>Ecology:</td><td>Temporary Modification of Water Quality Standards</td></tr><tr><td>Fish and Wildlife:</td><td>Hydraulic Project Approval Fish Planting Permit</td></tr><tr><td>Local:</td><td>Substantial Development Permit (Shoreline) in certain locales</td></tr><tr><td>Federal:</td><td>Section 404 Permit from the Army Corps of Engineers</td></tr></table>	Ecology:	Temporary Modification of Water Quality Standards	Fish and Wildlife:	Hydraulic Project Approval Fish Planting Permit	Local:	Substantial Development Permit (Shoreline) in certain locales	Federal:	Section 404 Permit from the Army Corps of Engineers
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# Acronyms/Abbreviations

<b>2,4-D BEE:</b>	2,4-D butoxyethyl ester (Aqua-Kleen® and Navigate®)
<b>2,4-D DMA:</b>	2,4-D Dimethylamine salt
<b>a.i.</b>	Active Ingredient
<b>CWA:</b>	Federal Water Pollution Control Act of 1972, known as the Clean Water Act
<b>DNR:</b>	Washington State Department of Natural Resources
<b>EEC:</b>	Expected Environmental Effects Concentration
<b>EIS:</b>	Environmental Impact Statement
<b>EPA:</b>	United States Environmental Protection Agency
<b>ESA:</b>	The Endangered Species Act
<b>EUP:</b>	Experimental Use Permit
<b>FSEIS:</b>	Final Supplemental Environmental Impact Statement
<b>FIFRA:</b>	Federal Insecticide, Fungicide, and Rodenticide Act, as amended
<b>GMA:</b>	Growth Management Act
<b>HPA:</b>	Habitat Conservation Plan (ESA Sections 10, 16 and 1539)
<b>HPA:</b>	Hydraulic Project Approval
<b>IPM:</b>	Integrated Pest Management (IPM Law is Chapter 17.15 RCW)
<b>IAVMP:</b>	Citizen's Manual for Developing Integrated Aquatic Vegetation Management Plans
<b>IVMP:</b>	Integrated Aquatic Vegetation Management Plans
<b>LC50:</b>	Lethal Concentration is 50%. The quantity of substance needed to kill 50% of test animals exposed to it within a specified time. This test applies to gasses, vapors, fumes and dusts.
<b>MC:</b>	Mosquito Control Policy
<b>MOS:</b>	Margin of Safety
<b>NMFS:</b>	National Marine Fisheries Services
<b>NOAA:</b>	National Oceanic and Atmospheric Association
<b>NOEC:</b>	No Observable Effect Concentration
<b>NOEL:</b>	No Observable Effect Level
<b>NWIFC:</b>	Northwest Indian Fisheries Commission
<b>RCW:</b>	Revised Code of Washington
<b>RQ:</b>	Risk Quotients (the ratio of exposure concentration divided by an effects concentration)
<b>SEIS:</b>	Supplemental Environmental Impact Statement
<b>SEPA:</b>	State Environmental Policy Act
<b>STM:</b>	Short-term modification of WQS, a permit per 173-201A-110 WAC
<b>U.S.C.:</b>	United States Code
<b>WAC:</b>	Washington Administrative Code
<b>WDFW:</b>	Washington State Department of Fish and Wildlife
<b>WQS:</b>	Water Quality Standards, Chapter 173-201A WAC
<b>WSDA:</b>	Washington State Department of Agriculture
<b>WSU:</b>	Washington State University

# Summary

The State of Washington Water Pollution Control Act (RCW 90.48) and the State Surface Water Quality Standards (Chapter 173-201A WAC) require the Department of Ecology (Ecology) to establish criteria and programs necessary to protect waters of the state. These standards articulate an intent to protect public health and maintain beneficial uses of surface waters, including recreational activities such as swimming, boating, and aesthetic enjoyment; public water supply; stock watering; fish migration and fish and shellfish, rearing, spawning, and harvesting; wildlife habitat, and commerce and navigation. Water Quality Standards (WQS) specifically allow Ecology to modify water quality criteria on a short-term basis to accommodate essential activities, respond to emergencies, or otherwise protect the public interest.

**The Need for Aquatic Plant Management** Aquatic plants are a valuable component of aquatic ecosystems that in normal situations require protection. Like algae, aquatic plants are a vital part of a watershed system because they provide cover, habitat and food for many species of aquatic biota, fish and wildlife. Aquatic plants also limit certain lake uses. Too many rooted and floating plants can degrade water quality, impair certain fisheries, block intakes that supply water for domestic or agricultural purposes, and interfere with navigation, recreation and aesthetics. In addition, noxious aquatic plant species such as Eurasian watermilfoil can form dense populations that may pose safety problems for swimmers and boaters and can degrade wildlife habitat by out-competing native species or changing water chemistry. Consequently, Ecology's Water Quality Program receives requests for permits from various entities to use herbicides and other control methods to manage excessive native and noxious aquatic plant species and algae in various waterbodies. In response to these requests and in accordance with the provisions of the State Environmental Policy Act (SEPA), Ecology determined that aquatic plant management by these methods may have significant adverse environmental impacts, and that an Environmental Impact Statement was necessary.

**Summary of the Proposal** In 1980, Ecology completed an *Environmental Impact Statement* (EIS) for statewide program guidance in the issuance of short-term modifications for herbicides used in aquatic plant control. Since 1980, a number of mechanical and physical methods (i.e. mechanical harvesting, rotovation, bottom barriers, and cutters) were developed and used extensively for aquatic vegetation control, and various methods of biological control have undergone research and development during the past two decades. Changes also occurred in the understanding of aquatic ecosystems, including the role of wetlands and the need to consider and control impacts such as nutrient and sediment loading within the total watershed of any particular waterbody. To address these changes and the broadening field of environmental choices in aquatic plant management, Ecology updated and supplemented the EIS with the *Final Supplemental Environmental Impact Statement for the Aquatic Plant Management Program* (SEIS), dated January 1992.

The current supplement, SEIS 2001, updates the 1992 SEIS and assesses new aquatic herbicides or permitted herbicides with recent label changes, for use in Washington waters. The herbicides were selected by the Agency Steering Committee for Update of the 1992 Aquatic Plant SEIS on the basis of registration status, desirability for use and direction from Senate Substitute Bill 5424 (1999, codified in RCW 90.48.447).

Ecology is the primary lead for the current supplemental update to the SEIS, but has received advisory and review assistance from the Agency Committee for Update of the 1992 Aquatic Plant SEIS (The Steering Committee). The Steering Committee is comprised of representatives from the State Departments of Agriculture, Health, Fish and Wildlife, Natural Resources, Ecology and the State Noxious Weed Control Board, all agencies with jurisdiction and/or interest in aquatic plant control. The Washington State Department of Agriculture (WSDA) is charged with regulating pesticide applicators, registering pesticides

for use in the state, and, along with the State Noxious Weed Control Board, with controlling noxious plants within the state. The Department of Health is charged with protection of human health. The Department of Fish and Wildlife has received requests for Hydraulic Project Approvals (HPA's) to implement various physical and mechanical methods and is charged with protecting fish and wildlife. The Departments of Natural Resources and Ecology have concerns with the potential impact of various plant control methods on the natural resources they are charged with managing. The Departments of Fish and Wildlife and Natural Resources have also been mandated by the legislature to develop programs for controlling particular noxious emergent species on state-owned or managed lands.

A technical advisory committee and a growing list of external reviewers have been commissioned to serve in a review capacity for the risk assessments and updates to the SEIS. The technical advisory committee enlists representatives of Lake Management Districts, local governments, scientists, tribes, pesticide registrants, and environmental groups. The external list of reviewers includes representation from those groups and adds representatives from the Washington Legislature, the United States Environmental Protection Agency, Washington State University, National Marine Fisheries Services, National Oceanic and Atmospheric Association, U.S. Fish & Wildlife, Northwest Coalition for Alternatives to Pesticides, Washington Toxics Coalition and the Northwest Indian Fisheries Commission.

**Impacts and Mitigation** Impacts and mitigation measures are discussed in detail in the risk assessment appendices for each herbicide reviewed for use by Ecology. The risk assessments examine the potential acute and chronic effects of single and seasonally reoccurring applications on aquatic plants and animals (invertebrates and vertebrates, and associated wildlife), including consideration of life cycles and food chain impacts. Where available, information on potential impacts and toxicity of one-time and repeated applications of each herbicide on numbers, diversity, and habitat of species of plants, fish, birds and other wildlife is included. Impacts (both risks and benefits) for spawning and rearing habitat used by various species, including but not limited to fresh water trout and sea run cutthroat trout are also considered. Discussions include direct and indirect impacts of herbicide treatments on the marine environment, salmonid smoltification and their survival life histories.

Impacts and mitigation measures are also discussed in the sections of the EIS that discuss alternative control methods. Environmental and human health impacts of each herbicide and control method are discussed in categories of earth, air, water and biota. Application conditions that minimize or mitigate adverse human health and environmental impacts are explored, and in some cases (i.e. swimming restrictions on endothall) have changed from those required in the 1992 SEIS to reflect new information concerning the impacts of the product.

This current Supplement recommends an Integrated Pest Management (IPM) approach as the preferred method of aquatic plant control to minimize adverse impacts. By definition, IPM uses the most efficient and effective control method, or combination of control methods, while minimizing impacts to human or environmental health. However, even under an IPM program, unavoidable, significant adverse impacts may occur that restricts other beneficial water uses. The development of a lake or aquatic plant management plan allows for the establishment of use priorities by the parties involved while maintaining and protecting the uses of a particular waterbody. Management plans help to ensure that proven control methods will be implemented for the long-term management of the waterbody and that problems such as nutrient enrichment and sediment loading, which often are the cause of accelerated plant and algae growth, are addressed. Planning further assures that aquatic plant managers will not rely on aquatic plant control methods that may only address the symptoms of such problems.

**Alternatives** The 1980 EIS evaluated the impacts of endothall, diquat, dichlobenil (2,6-dichlorobenzonitrile), 2,4-D [(2,4-dichlorophenoxy) acetic acid], copper sulfate, komeen and simazine, all aquatic herbicides used for control of nuisance aquatic vegetation. Since 1980, diquat, dichlobenil, 2,4-D,

and simazine were discontinued for use in the program and fluridone and glyphosate were introduced. The 1992 SEIS introduced an integrated pest management approach as the preferred method of control and evaluated the use of chemical controls only, physical controls only, biological controls only, continuation of current practices, and taking no action relative to controlling nuisance aquatic plants. The 1992 SEIS evaluated and allowed the use of copper, endothall, fluridone and glyphosate to control various types of aquatic plants.

SEIS 2001 contains an update of the alternatives included in the 1992 supplement and evaluates two additional sets of herbicides. The first set includes 2,4-D formulations registered for aquatic use by the state and endothall formulations Hydrothol® 191 and Aquathol®, completed May 2000. A second set of assessments, scheduled for completion February 2001, will evaluate diquat, triclopyr, and copper compounds.

**The Objectives of the Environmental Impact Statement and Subsequent Supplements** Ecology uses the 1980 EIS and subsequent supplements as guidance to decide whether to approve, deny, or add conditions to permits related to aquatic plant management. The objective of the current supplement is to update the 1992 SEIS and to provide the Water Quality Program with the most recent research available. We are exploring methods to keep the guidance current. New herbicides and other control methods for aquatic plants continue to evolve, and the 1999 Legislature directed Ecology to make our permitting program more responsive to the application of new, commercially available herbicides, and to evaluate their use with the most recent research available (RCW 90.48.447).

**Major Conclusions** Treatment scenarios and objectives for noxious (non-native) versus native plants differ and necessitate a clear integrated aquatic plant management plan to address those differences. It was found that having a variety of control methods available provides the flexibility necessary to control nuisance populations of native as well as invasive non-native species in situations where it is also desirable to maintain other, often conflicting beneficial water uses. The current supplement (SEIS 2001) recommends an Integrated Pest Management (IPM) approach using the most efficient and effective control method, or combination of control methods, while minimizing impacts to human or environmental health. The IPM approach includes follow-up methods to treatments and long-term lake and watershed plans to address nutrient and sediment enrichment.

**Endangered Species Act and Wetland Issues** Special consideration is given to salmonids and other listed species under the Endangered Species Act (ESA). Ecology's Aquatic Plant Management Program requires that permits be processed or denied depending on the potential impact to ESA listed species, the seriousness of the aquatic plant problem and the degree to which integrated aquatic plant management plans have been considered. Also essential is conformance to the Governor of Washington's goal of no net loss of wetland acreage or function. Therefore each alternative must be evaluated to determine the degree to which wetlands would be impacted, consistent with policies and standards being developed by Ecology and other agencies. Within this context, a priority is given to the control of noxious aquatic plant species.

# **Section I. Introduction to Lake and Aquatic Plant Management**

## **A. Background**

The State of Washington has an abundance of surface water resources, including approximately 7,800 lakes, ponds and reservoirs, 40,492 miles of rivers and streams, and untold acres of wetlands. Within these diverse waters, there is a great range of conditions such as hardness, pH, dissolved oxygen, turbidity, nutrients, size, flow, biota and use. Citizens rely on these waterbodies for a number of uses, such as recreation in the form of swimming, fishing, boating and aesthetic enjoyment; commerce and navigation; water supply for domestic, industrial and agriculture activities; and habitat for fish and wildlife.

Our understanding of how aquatic systems function has grown during the past two decades. Aquatic systems change slowly through a natural aging process called eutrophication. This process is typified by increased productivity, structural simplification of biotic components, and a reduction in the metabolic ability of organisms to adapt growth responses to imposed changes (i.e., reduced stability) (Wetzel 1975). Advanced stages of eutrophication in aquatic systems may represent natural processes but are often out of equilibrium with respect to the freshwater chemical and biotic characteristics desired for anthropic purposes.

Many human activities have affected conditions of drainage basins, water budgets, and nutrient budgets, resulting in accelerated productivity and eutrophication. As Vallentyne described (1974), a common result of misuse of the drainage basin and the excessive loading of nutrients and sediments in fresh waters is the acceleration of eutrophication, literally turning lakes into "algal bowls" (Wetzel 1975). Accelerated eutrophication often results in increased primary productivity, including increased plant growth in shallow areas of the lake. Thus, effective treatment of excessive aquatic plant populations and algae must include controlling the introduction of nutrients and sediments from sources throughout the entire watershed.

Human activities are also often responsible for the introduction of exotic species into aquatic environments. Our increased knowledge of the function of wetlands has resulted in a reassessment of management strategies for native versus invasive species. Native species are needed to maintain or enhance an aquatic system. However, noxious species often degrade aquatic systems to a degree that may require eradication to protect and maintain established beneficial uses. The prevention, control, and eradication of noxious species needs to be given a high priority in the development of lake and watershed management plans and may require extensive control measures.

## **B. Goals of the 1980 Environmental Impact Statement and Supplements**

The 1980 EIS addressed control of aquatic plants through the use of herbicides and examined the alternative of no action. This approach treated the symptoms but not the underlying problems of lake enrichment and aquatic plant and algae growth. The 1987 amendments to the Federal Clean Water Act required the development and implementation of programs designed to reduce or eliminate the introduction of toxic substances to our nation's waters. In addition, new scientific evidence concerning the potential impacts that certain toxic substances may have on human and aquatic life have increased public awareness regarding the intentional introduction of toxic substances to surface waters, even in situations where their introduction may enhance the uses of a waterbody. Thus, a more thorough review and analysis of the benefits of aquatic

herbicides relative to the potential risks to human and environmental health was deemed warranted. Subsequently, the 1992 SEIS proposed an aquatic plant management approach that integrated herbicide use with manual, mechanical and biological methods and considered the context of whole lake and/or watershed systems.

Ecology's current aquatic plant management program encourages an understanding of natural aquatic processes, including the role of aquatic plants in a natural system, plant identification and the underlying causes of excessive plant growth. Through this process, people can make informed selections of methods for reducing nutrient and sediment loading and meeting long-term management goals. This is consistent with Ecology's sustainability goals, which recommend the development of integrated aquatic plant management plans by communities, professional herbicide applicators, groups and others who request permits for aquatic plant management. Ideally, an aquatic plant management plan should be prepared before certain permits are issued for use of herbicides, and in regard to public waters, a wide range of participation is essential for the benefit of all users, not simply the adjacent property owners. However, in the case of new infestations of noxious (non-native) and invasive plants, early control may be necessary and preclude the development of a plan for the first season of treatment.

Addressing the potential loss of habitat or habitat disruption from aquatic plant control strategies must also be a goal in the development and implementation of any aquatic plant management program. This is especially true now that species of salmon, trout, char or steelhead have been listed in nearly every county in Washington as a candidate, a threatened or endangered species under the Endangered Species Act (ESA). Currently, Washington has 28 state candidate fish species and 3 state sensitive species including many species of marine fish. (For current listings see <http://www.governor.wa.gov/esa/regions.htm>.)

Wetlands have often been overlooked as a key component of aquatic systems. The value and function of wetlands is increasingly being recognized and must be incorporated into any comprehensive lake or vegetation management plan. In addition, the Governor of Washington has adopted through executive order (EO 89-10) a goal of no net loss of wetland acreage or function in the state. All management strategies for aquatic vegetation must consider this goal.

## **C. Aquatic Plant Control Regulation**

### **1. Introduction**

The State of Washington regulates aquatic plant control through several agencies concerned with various aspects of aquatic plant growth and control. Aquatic plants appear in many shapes and sizes. Some have leaves that float on the water surface, while others grow completely underwater. They grow wherever water is persistent, in rivers, streams, lakes, wetlands, coastlands or marine waters. In moderation, aquatic plants are aesthetically pleasing and desirable environmentally. The presence of native species is natural and normal in lakes and other water bodies because they provide important links in aquatic life systems. In large quantities, however, plants can interfere with water uses and may be seen as a problem. An overabundance of native plants may indicate excessive nutrients (nitrogen or phosphorus) in the water column. Conversely, non-native aquatic plants and excessive plant nutrients are often a threat to the health of the aquatic environment. The introduction of non-native aquatic plants and excessive plant nutrients has created many aquatic problems for Washington waters. The removal of non-native aquatic plants from the aquatic system is often desirable and even necessary to enhance water quality and protect beneficial uses.



The management of aquatic plants under their respective jurisdictional authorities can be generally categorized by the control method used and by the type of plant controlled. In any case of uncertainty, the **Permit Assistance Center should be contacted at (360) 407-7037** before an aquatic plant removal or control project is initiated.

## **2. Regulatory Requirements for Manual, Mechanical and Biological Methods**

**Manual Methods** The Washington State Department of Fish and Wildlife (WDFW) requires either an individual or general permit called an **Hydraulic Project Approval (HPA)** (RCW 77.55.100. (14)) for all activities taking place in the water including hand pulling, raking, and cutting of aquatic plants. However, projects conducted for the control of spartina and purple loosestrife may not require an HPA. Information regarding HPA permits can be obtained from the local office of WDFW. To request a copy of the Aquatic Plants and Fish pamphlet, please contact:

**WDFW  
Habitat Program  
600 Capitol Way N  
Olympia WA 98501-1091  
(360) 902-2534 <http://www.wa.gov/wdfw/hab/aquaplnt/aquaplnt.htm>**

**Mechanical Cutting** Mechanical cutting requires an HPA, obtained free of charge from WDFW. For projects costing over \$2,500, check with your city or county to see if a shoreline permit is required.

**Bottom Screening** Bottom screening in Washington requires hydraulic approval, obtained free from WDFW. Check with your city or county to determine whether a shoreline permit is required.

**Weed Rolling** Installation of weed rolling devices requires hydraulic approval obtained free from WDFW. Check with your city or county to determine whether a shoreline permit is required.

**Grass Carp and other Biological Controls** A grass carp fish-planting permit must be obtained from the WDFW, check with your regional office. Also, if inlets or outlets need to be screened, an HPA application must be completed for the screening project.

**Diver Dredging** Diver dredging requires hydraulic approval from WDFW and a permit from Ecology. Check with you city or county for any local requirements before proceeding with a diver-dredging project. Diver dredging may also require a Section 404 permit from the U.S. Army Corps of Engineers.

**Water Level Drawdown** Permits are required for many types of projects in lakes and streams. Check with city, county and state agencies before proceeding with a water level drawdown.

**Mechanical Harvesting** Harvesting in Washington requires an HPA from WDFW. Some Shoreline Master Programs may also require permits for harvesting. Check with your city or county government.

**Rotovation** Rotovation requires several permits, including 1) an HPA from WDFW, 2) a permit from an Ecology regional office, 3) a shoreline permit from the city or county may also be needed, and 4) a Section 404 permit obtained from the Army Corps of Engineers may be required.